REMARKS:

Applicants would again like to thank the Examiner for the indication that claim 2 is allowed.

In the Office Action, claims 1 and 3-10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Santurtun et al. in view of Inoue. Applicant respectfully submits that for the reasons stated below, the present invention should be patentable over these cited references.

The present invention is drawn to a method, and circuit or device for detecting electric discharges that may occur to an x-ray tube. For clarification, Applicant uses the term "discharge" in the specification and claims as referring to a "short circuit" situation where electric current finds a way to bypass the circuit it is supposed to flow through. The specification states in lines 17-20 on page 4 that

> "[e]lectric discharge phenomenon occurs in various forms, including glow discharge inside an x-ray tube, discharge between the x-ray 1 and the housing wall, and discharge in a high voltage cable connection are."

Thus, the "discharge" or "discharge phenomenon" referred to in the specification and claims of the present application should not be confused with a discharge of electricity that normally occurs between the cathode and anode of an x-ray tube.

Such a discharge phenomenon, or a short circuit, as referred to in the present application takes the form of steep fluctuations of voltage applied to the x-ray tube. The discharge occurs, or the short circuit is created, only when voltage applied to the x-ray tube becomes high enough for electricity to find a way to flow through a less insulated path. After electricity flows through the less insulated path, the voltage comes down, and the short circuit closes. The voltage then goes up, and the discharge occurs again. In this way, a discharge is repeated, and the voltage exhibits steep fluctuations. This discharge phenomenon can be detected by monitoring and identifying the steep fluctuations of the x-ray voltage caused by the electric discharges. More specifically, in the present invention, the fluctuations of the voltage are monitored and counted by a counter. When the count of the fluctuations reaches a predetermined number, it is determined that a discharge occurs.

Santurtun discloses a high-voltage feedback from an x-ray tube. The Santurtun device is responsive to the feedback to control the operation of an inverter in such a way as to maintain a predetermined voltage level to the x-ray tube. (lines 58-64, column 3). The important distinction between Santurtun and the present invention is that Santurtun monitors the voltage itself, whereas the present invention monitors or looks for the discharge phenomenon or fluctuations of the voltage (see claims 1, 3 and 7). Since Santurtun monitors the voltage itself, not fluctuations of the voltage, as correctly determined by the Examiner, Santurtun is totally silent about the idea of counting fluctuations of the voltage.

Inoue is further remotely related to the present invention. Inoue is directed to electrical discharge machining in which electrical discharges are effected across a machining gap formed between a tool electrode and a workpiece adjacently located thereto to remove material from the workpiece. (lines 13-18, column 1). Such a machining gap, as can be imagined, is prone to contamination. (lines 24-40, column 1). To detect contamination of the machining gap, Inoue inserts, at regular intervals, monitoring pulses in an allay of machining pulses. (Figs. 1A-1E). The monitoring pulses have pre-selected voltage and duration which are distinctive from those of the machining pulses. The monitoring pulses are observed to see if there is any deviation in shape from what the monitoring pulse shape is supposed to be in order to determine whether the machining gap is contaminated.

The Examiner indicated in the Office Action that Inoue discloses the idea of counting fluctuation of the x-ray tube voltage and cited the paragraph in column 2, line 62 through column 3, line 8. Applicant finds that the cited paragraph in no way suggests or teaches counting of fluctuations of the x-ray tube voltage. Applicant finds that the cited paragraph only mentions a way of observing the shapes of the monitoring pulses.

As shown in Fig. 2, Inoue has a power source 3 which supplies, as triggered by a switch 4, electricity to a gap G for discharge. To insert the monitoring pulses at regular intervals, the machining pulses are counted by a counter 5. When inserting a monitoring discharge, the switch 4 is disabled by a AND gate 7, but a switch 5 is activated instead. Thus, Inoue is not counting fluctuations of the voltage but counting applications of the machining voltage to insert the monitoring voltage at regular intervals in the applications of the machining voltage. Like

Santurtun, Inoue is totally silent about the idea of counting fluctuations of voltage applied to an x-ray tube.

Respectfully submitted,

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